REMARKS

By this Amendment, claim 19 is amended, and claims 22-27 are added. Claims 5-18 and 20-21 remain in the application. Thus, claims 5-27 are active in the application. Reexamination and reconsideration of the application are respectfully requested.

Initially, the Applicants thank the Examiner for kindly indicating, on pages 5-6 of the Office Action, that claims 8-18 are allowed.

The Applicants submit that new dependent claims 22-27 are fully supported by the original specification. In particular, new dependent claims 22 and 25 are supported by lines 32-26 on page 9 of the original specification (lines 8-13 on page 10 of the substitute specification), new dependent claims 23 and 26 are supported by lines 1-3 on page 10 of the original specification (lines 14-16 on page 10 of the substitute specification), and new dependent claims 24 and 27 are supported by lines 35-37 on page 43 to line 3 on page 44 of the original specification (lines 3-6 on page 45 of the substitute specification). Accordingly, no new matter has been added.

On page 2 of the Office Action, claims 5-7 and 19-21 were newly rejected under 35 U.S.C. § 102(a) as being anticipated by Keller et al. (U.S. 6,063,315). This rejection is respectfully traversed for the following reasons.

The present invention provides for the injection of a first molten thermoplastic resin from a first injection cylinder into a cavity. The present invention also provides for the injection of a second molten thermoplastic resin from a second injection cylinder into the cavity without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity. The second molten thermoplastic resin can be injected into the cavity either concurrently with the injection of the first molten thermoplastic resin into the cavity, during the injection of the first molten thermoplastic resin into the cavity, or after the completion of the injection of the first molten thermoplastic resin into the cavity. The second molten thermoplastic resin does not come into contact with the first molten thermoplastic resin until a pressurized fluid is introduced into the second thermoplastic resin to thereby form a hollow portion inside the second thermoplastic resin. As a result of this inventive process, and as described in lines 21 to 27 on page 9 of the specification, a desired portion of the molded article can be reliably constituted of the first

and second thermoplastic resins, and the form (the thickness, width and length, for example), of the portions of the molded article which are made of the first and second thermoplastic resins can be accurately and easily controlled.

Claims 5 and 19 each recite a method for injection molding a molded article having a hollow portion. The method of claims 5 and 19 each comprises injecting a first molten thermoplastic resin from the first injection cylinder into the cavity through the first-molten-resin injection portion. Further, the method of claims 5 and 19 further comprise injecting the second molten thermoplastic resin from the second injection cylinder into the cavity through the second-molten-resin injection portion, without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity, concurrently with the start of the injection of the first molten thermoplastic resin into the cavity, during the injection of the first molten thermoplastic resin into the cavity, or after completion of the injection of the first molten thermoplastic resin into the cavity. Further, the method of claims 5 and 19 comprise introducing the pressurized fluid into the second molten thermoplastic resin in the cavity from the pressurized-fluid introducing portion during the injecting the second molten thermoplastic resin into the cavity or after completion of the injecting the second molten thermoplastic resin into the cavity to thereby form the hollow portion inside the second thermoplastic resin.

Despite the Examiner's assertion to the contrary, Keller et al. does not disclose or suggest injecting the second molten thermoplastic resin from the second injection cylinder into the cavity through the second-molten-resin injection portion, without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity, concurrently with the start of the injection of the first molten thermoplastic resin into the cavity, during the injection of the first molten thermoplastic resin into the cavity, or after completion of the injection of the first molten thermoplastic resin into the cavity, as recited in claims 5 and 19.

Instead, Keller et al. discloses a gas-assisted injection molding process that consists of injection molding molten thermoplastic resin into a mold cavity at a first location through a first injection conduit 32. Then, molten thermoplastic resin is injection molded into the mold cavity at a second location, which is spaced from the first location, substantially simultaneously with the

arrival of the molten thermoplastic resin from the first location at the second location (see Column 3, lines 1-8, Column 6, lines 50-64). A sensor 46 is provided at the second location to detect when the "first" molten thermoplastic resin arrives at the second location, whereupon the controller causes the second gate valve 66 to open for the "second" molten thermoplastic resin to be injection molded into the mold cavity at the second location (see Column 6, lines 59-64). That is, Keller et al. discloses that "when the [second] molten thermoplastic resin reaches the second drop conduit 34, the pressure detected by the second pressure detector 46 will increase, thereby indicating that the presence of the [first] molten material at the second drop conduit 34. At this time, the controller closes the first gate 64 and opens the second gate valve 66 so that the [second] molten thermoplastic resin flows through the second drop conduit 34 to a second location in the mold cavity" (see Column 7, lines 44-51).

Thus, since the "second" molten thermoplastic is disclosed as being injection molded at the second location when the "first" molten thermoplastic resin arrives at the second location, Keller et al. clearly discloses that the second molten thermoplastic resin is brought into contact with the first molten thermoplastic resin at the second location as soon as the second molten thermoplastic resin is released through the second drop conduit 34 at the second location.

Therefore, Keller et al. clearly does not disclose or suggest injecting the second molten thermoplastic resin from the second injection cylinder into the cavity through the second-molten-resin injection portion, without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity, concurrently with the start of the injection of the first molten thermoplastic resin into the cavity, during the injection of the first molten thermoplastic resin into the cavity, or after completion of the injection of the first molten thermoplastic resin into the cavity, as recited in claims 5 and 19.

To further illustrate that Keller et al. does not disclose or suggest injecting the second molten thermoplastic resin without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity, Keller et al. also discloses that the injection molding of larger articles requires multiple drops (gates), and that all gates typically open simultaneously, where the use of multiple gates typically produce multiple knit lines (see Column

2, lines 15-17). Keller et al. further discloses that "the sequencing of gates for the molten thermoplastic resin provides a continuous flow of resin throughout the mold without interfacing of two or more wave fronts of molten thermoplastic resin. Thus, the surface formed in the mold cavity is smooth and free of knit lines" (see Column 8, lines 30-35).

As is known in the art, a knit line (weld line) arises at the interface of two or more wave fronts of the molten thermoplastic resin. The knit line inevitably occurs when injection of the second molten thermoplastic resin is initiated without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity, since the wave front of the second molten thermoplastic resin collides with the wave front of the first molten thermoplastic resin after a brief interval from the injection of the second molten thermoplastic resin. However, as described above, the (first and second) molten thermoplastic resin has a continuous flow of resin throughout the mold without interfacing of two or more wave fronts of the molten thermoplastic resin. Accordingly, Keller et al. clearly discloses that the first molten thermoplastic resin is substantially simultaneously brought into contact with the second molten thermoplastic resin at the second location when the second molten thermoplastic resin flows through the second drop conduit 34 at the second location (see Column 7, lines 44-51).

Therefore, Keller et al. clearly does not disclose or suggest injecting the second molten thermoplastic resin from the second injection cylinder into the cavity through the second-molten-resin injection portion, without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity, concurrently with the start of the injection of the first molten thermoplastic resin into the cavity, during the injection of the first molten thermoplastic resin into the cavity, or after completion of the injection of the first molten thermoplastic resin into the cavity, as recited in claims 5 and 19.

Furthermore, Keller et al. does not disclose or suggest introducing a pressurized fluid into the second molten thermoplastic resin in the cavity from the pressurized-fluid portion during the injecting of a second molten thermoplastic resin into the cavity or after completion of the injecting the second molten thermoplastic resin into the cavity to thereby form the hollow portion inside the second molten thermoplastic resin, as recited in claims 5 and 19.

As described above, Keller et al. clearly does not disclose injecting the second molten thermoplastic resin from the second injection cylinder into the cavity through the second-molten-resin injection portion, without bringing the second molten thermoplastic resin into contact with the first molten thermoplastic resin injected into the cavity, as recited in claims 5 and 19. Accordingly, Keller also does not disclose or suggest introducing the pressurized fluid into the second molten thermoplastic resin in the cavity from the pressurized-fluid portion during the injecting of a second molten thermoplastic resin into the cavity or after completion of the injecting the second molten thermoplastic resin into the cavity, as recited in claims 5 and 19.

Furthermore, Keller et al. discloses that inert gas is injected into the molten thermoplastic resin at the first location through the first air-injection conduit 38, at the second location through the second air-injection conduit 40, and at the third location through the third air-injection conduit 42. As described above, the molten thermoplastic resin is injected into the cavity of Keller et al. from the various locations so as to continuously flow and thereby be one continuous molten thermoplastic resin. The injection of pressurized air into the cavity of Keller et al., however, is not disclosed as forming a hollow portion inside the "second" molten thermoplastic resin since the "first" molten thermoplastic resin comes into contact with the "second" molten thermoplastic resin as soon as the "second" molten thermoplastic resin is released through the second drop conduit 34, and thus, the pressurized air forms hollow portions inside the continuous combination of the first and second molten thermoplastic resins.

Accordingly, Keller et al. also clearly does not disclose or suggest introducing a pressurized fluid into the second molten thermoplastic resin in the cavity from the pressurized-fluid portion during the injecting of a second molten thermoplastic resin into the cavity or after completion of the injecting the second molten thermoplastic resin into the cavity to thereby form the hollow portion inside the second molten thermoplastic resin, as recited in claims 5 and 19.

Therefore, the Applicants respectfully submit that Keller et al. does not anticipate claims 5 and 19 since Keller et al. fails to disclose each and every limitation as recited in claims 5 and 19.

Because of the clear distinctions discussed above, it is submitted that the teachings of Keller et al. do not meet each and every limitation of claims 5 and 19. Furthermore, it is submitted that the

distinctions are such that a person having ordinary skill in the art at the time the invention was made would not have been motivated to modify Keller et al., or to make any combination of the references of record, in such as manner as to result in, or otherwise render obvious, the present invention as recited in claims 5 and 19. Therefore, it is submitted that claims 5 and 19, as well as claims 6-7 and 20-27 which depend therefrom, are clearly allowable over the prior art as applied by the Examiner.

In view of the foregoing amendments and remarks, it is respectfully submitted that the present application is clearly in condition for allowance. An early notice thereof is respectfully solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, it is respectfully requested that the Examiner contact the undersigned by telephone in order to resolve such issues.

A fee and a Petition for a one-month Extension of Time are filed herewith pursuant to 37 CFR § 1.136(a).

Respectfully submitted,

Yoshihiro KAYANO et al.

By: Jonathan R. Bowser

Jonathan R. Bowser
Registration No. 54,574
Attorney for Applicants

JRB/nk
Washington, D.C. 20006-1021
Telephone (202) 721-8200
Facsimile (202) 721-8250
April 16, 2004